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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/766,341 | 01/27/2004 | Manoj Ramprasad Shah | 136967 (1306-49) | 3284 |
| 6147 | 7590 | 12/05/2006 | EXAMINER | |
| GENERAL ELECTRIC COMPANY GLOBAL RESEARCH PATENT DOCKET RM. BLDG. K1-4A59 NISKAYUNA, NY 12309 | | | | LE, DANG D |
| | | ART UNIT | | PAPER NUMBER |
| | | 2834 | | |

DATE MAILED: 12/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|------------------------|------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/766,341 | SHAH ET AL. |
| | Examiner Dang D. Le | Art Unit 2834 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 22 September 2006.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-11, 13-15, 19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-11, 13-15, 19 and 20 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date, _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 9/22/06 have been fully considered but they are not persuasive.

In the art of motor and generator, it is well known that iron cores can be used instead of air cores for the purpose of directing the magnetic flux, which in turn helps to increase the starting torque. Hoffmann et al. uses air cores for AC field windings 62, which are starting coils (column 3, line 47). Hammerstrom et al. uses iron cores for AC field windings 26 and 27, which are also starting coils (column 5, lines 55-60). As a result, it is obvious to replace the air cores of Hoffman et al. with the iron cores of Hammerstrom et al.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-11, 13, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffmann et al. (4,093,869) in view of Hammerstrom et al. (2,732,509).

Regarding claim 1, Hoffman et al. shows a synchronous electric machine having a rotor member (25) and a stator member (50) having a stator core (Figures 2 and 3), the electric machine comprising:

- a main machine having a direct current (DC) rotor field winding (26) mounted on the rotor member, and
- a dual alternating current/direct current (AC/DC) excitation system for said synchronous machine comprising:
- a rotatable polyphase armature winding (24) in electrical communication with a rectifier assembly (16) for conducting direct current to said rotor field winding;
- a plurality of DC salient poles (52) and at least one alternating current (AC) air pole both included in the stator core, wherein respective AC air poles of the at least one AC air pole are disposed between adjacent DC salient poles of the plurality of DC salient poles;
- at least one DC field winding (57), each DC field winding having at least one DC field coil disposed on at least one DC salient pole of the plurality of DC salient poles; and

- at least one AC field winding (62), each AC field winding having at least one AC field coil disposed on at least one AC air pole of the at least one AC air pole, a magnetic axis of respective AC field coils being disposed substantially in electromagnetic space-quadrature relation with respect to magnetic axes of adjacent DC field coils, wherein when said respective AC field coils (62) are energized, an alternating current is induced in said polyphase armature winding for providing excitation to said main machine.

Hoffman et al. does not show the use of alternating current (AC) salient poles and with said DC field coils and said AC field coils being circumferentially arranged at a same radial distance from the shaft. Hoffmann et al. use air cores between DC salient poles (52, Figure 3 and column 4, lines 46-48).

Hammerstrom et al. uses alternating current (AC) salient poles (coils 26 and 27 around stator poles in Figure 1) with the DC field coils (17, 18) and the AC field coils (26, 27) being circumferentially arranged at a same radial distance from the shaft (128) for the purpose of increasing the starting torque of the starter.

It is noted that in the art of motor and generator, it is well known that the stator can be made with either air cores or iron cores. Iron cores can concentrate or guide magnetic flux and increase magnetic flux (magnetic field) but more expensive because of the cost of the iron cores. In contrast, air cores are cheaper but do not produce strong magnetic flux and cannot guide magnetic flux.

Since Hoffman et al. and Hammerstrom et al. are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize iron cores instead of air cores and to arrange all the coils at a same radial distance from the shaft as taught by Hammerstrom et al. for the purpose discussed above.

Regarding claims 2 and 3, it is noted that Hoffman et al. also shows all of the limitations of the claimed invention including thin sheet iron laminations (column 3, lines 20-22).

Regarding claim 4, it is noted that Hammerstrom et al. also shows all of the limitations of the claimed invention including the size being selectable in accordance with applications requirements for starting and running the main machine (the size is chosen to be the same (the ratio being equal to 1) in Hammerstrom et al.)

Regarding claim 5, it is noted that Hammerstrom et al. also shows all of the limitations of the claimed invention in column 4, lines 25-35 and column 5, lines 45-50).

Regarding claims 6-8, 10, and 11, these claims are similar to claims 1-5, respectively. As a result, they are also rejected.

Regarding claim 9, it is noted that Hammerstrom et al. also shows all of the limitations of the claimed invention in Figure 1.

Regarding claims 13 and 19, it is noted that Hoffmann et al. and Hammerstrom et al. both show single phase windings could also be used.

5. Claims 14-15 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffmann et al. in view of Hammerstrom et al. as respectively applied to claims 1 and 6 above, and further in view of Sibata (5,220,228).

Regarding claims 14-16 and 20, the machine of Hoffmann et al. modified by Hammerstrom et al. includes all of the limitations of the claimed invention except for the flared extension.

Sibata provides the flared extension (14a, 14b) for the purpose of enhancing the sinusoidal waveform of the induced voltage.

Since Hoffmann et al., Hammerstrom et al., and Sibata are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to include flared extension as taught by Sibata for the purpose discussed above.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Information on How to Contact USPTO

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dang D. Le whose telephone number is (571) 272-2027. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571) 272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DANG LE
PRIMARY EXAMINER

11/30/06

